

## SEQUENCE LISTING

<110> BJORCK, LARS  
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 MORGELIN, MATTHIAS  
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 LINDBOM, LENNART  
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 CRAMER, HENNING  
 FLODGAARD, HANS

<120> METHOD FOR IDENTIFYING AN ANTI-STREPTOCOCCAL AGENT AND  
 ITS USE FOR TREATING STREPTOCOCCAL INFECTIONS

<130> 053694-0131

<140> 10/553,904  
 <141> 2005-10-21

<150> PCT/EP04/004429  
 <151> 2004-04-23

<150> GB 0309246.7  
 <151> 2003-04-23

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 <151> 2003-12-16

<160> 11

<170> PatentIn Ver. 3.3

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 <211> 484  
 <212> PRT  
 <213> Streptococcus pyogenes

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 35 40 45  
 Glu Val Ile Glu Asp Leu Ala Ala Asn Asn Pro Ala Ile Gln Asn Ile  
 50 55 60  
 Arg Leu Arg Tyr Glu Asn Lys Asp Leu Lys Ala Arg Leu Glu Asn Ala  
 65 70 75 80  
 Met Glu Val Ala Gly Arg Asp Phe Lys Arg Ala Glu Glu Leu Glu Lys  
 85 90 95

Ala Lys Gln Ala Leu Glu Asp Gln Arg Lys Asp Leu Glu Thr Lys Leu  
 100 105 110  
 Lys Glu Leu Gln Gln Asp Tyr Asp Leu Ala Lys Glu Ser Thr Ser Trp  
 115 120 125  
 Asp Arg Gln Arg Leu Glu Lys Glu Leu Glu Glu Lys Lys Glu Ala Leu  
 130 135 140  
 Glu Leu Ala Ile Asp Gln Ala Ser Arg Asp Tyr His Arg Ala Thr Ala  
 145 150 155 160  
 Leu Glu Lys Glu Leu Glu Glu Lys Lys Lys Ala Leu Glu Leu Ala Ile  
 165 170 175  
 Asp Gln Ala Ser Gln Asp Tyr Asn Arg Ala Asn Val Leu Glu Lys Glu  
 180 185 190  
 Leu Glu Thr Ile Thr Arg Glu Gln Glu Ile Asn Arg Asn Leu Leu Gly  
 195 200 205  
 Asn Ala Lys Leu Glu Leu Asp Gln Leu Ser Ser Glu Lys Glu Gln Leu  
 210 215 220  
 Thr Ile Glu Lys Ala Lys Leu Glu Glu Glu Lys Gln Ile Ser Asp Ala  
 225 230 235 240  
 Ser Arg Gln Ser Leu Arg Arg Asp Leu Asp Ala Ser Arg Glu Ala Lys  
 245 250 255  
 Lys Gln Val Glu Lys Asp Leu Ala Asn Leu Thr Ala Glu Leu Asp Lys  
 260 265 270  
 Val Lys Glu Asp Lys Gln Ile Ser Asp Ala Ser Arg Gln Gly Leu Arg  
 275 280 285  
 Arg Asp Leu Asp Ala Ser Arg Glu Ala Lys Lys Gln Val Glu Lys Asp  
 290 295 300  
 Leu Ala Asn Leu Thr Ala Glu Leu Asp Lys Val Lys Glu Glu Lys Gln  
 305 310 315 320  
 Ile Ser Asp Ala Ser Arg Gln Gly Leu Arg Arg Asp Leu Asp Ala Ser  
 325 330 335  
 Arg Glu Ala Lys Lys Gln Val Glu Lys Ala Leu Glu Glu Ala Asn Ser  
 340 345 350  
 Lys Leu Ala Ala Leu Glu Lys Leu Asn Lys Glu Leu Glu Glu Ser Lys  
 355 360 365  
 Lys Leu Thr Glu Lys Glu Lys Ala Glu Leu Gln Ala Lys Leu Glu Ala  
 370 375 380  
 Glu Ala Lys Ala Leu Lys Glu Gln Leu Ala Lys Gln Ala Glu Glu Leu  
 385 390 395 400

Ala Lys Leu Arg Ala Gly Lys Ala Ser Asp Ser Gln Thr Pro Asp Thr  
                             405                            410                            415

Lys Pro Gly Asn Lys Ala Val Pro Gly Lys Gly Gln Ala Pro Gln Ala  
                             420                            425                            430

Gly Thr Lys Pro Asn Gln Asn Lys Ala Pro Met Lys Glu Thr Lys Arg  
                             435                            440                            445

Gln Leu Pro Ser Thr Gly Glu Thr Ala Asn Pro Phe Phe Thr Ala Ala  
                             450                            455                            460

Ala Leu Thr Val Met Ala Thr Ala Gly Val Ala Ala Val Val Lys Arg  
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Lys Glu Glu Asn

<210> 2  
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 <213> Artificial Sequence

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 <223> Description of Artificial Sequence: Synthetic  
           peptide

<400> 2  
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<210> 3  
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 <213> Artificial Sequence

<220>  
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           peptide

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 Gly His Arg Pro  
       1

<210> 4  
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<210> 5  
 <211> 644  
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 <213> Homo sapiens

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                   20                  25                  30  
 Gly Val Arg Gly Pro Arg Val Val Glu Arg His Gln Ser Ala Cys Lys  
                   35                  40                  45  
 Asp Ser Asp Trp Pro Phe Cys Ser Asp Glu Asp Trp Asn Tyr Lys Cys  
           50                  55                  60  
 Pro Ser Gly Cys Arg Met Lys Gly Leu Ile Asp Glu Val Asn Gln Asp  
   65                  70                  75                  80  
 Phe Thr Asn Arg Ile Asn Lys Leu Lys Asn Ser Leu Phe Glu Tyr Gln  
                   85                  90                  95  
 Lys Asn Asn Lys Asp Ser His Ser Leu Thr Thr Asn Ile Met Glu Ile  
                   100                  105                  110  
 Leu Arg Gly Asp Phe Ser Ser Ala Asn Asn Arg Asp Asn Thr Tyr Asn  
           115                  120                  125  
 Arg Val Ser Glu Asp Leu Arg Ser Arg Ile Glu Val Leu Lys Arg Lys  
   130                  135                  140  
 Val Ile Glu Lys Val Gln His Ile Gln Leu Leu Gln Lys Asn Val Arg  
  145                  150                  155                  160  
 Ala Gln Leu Val Asp Met Lys Arg Leu Glu Val Asp Ile Asp Ile Lys  
                   165                  170                  175  
 Ile Arg Ser Cys Arg Gly Ser Cys Ser Arg Ala Leu Ala Arg Glu Val  
           180                  185                  190  
 Asp Leu Lys Asp Tyr Glu Asp Gln Gln Lys Gln Leu Glu Gln Val Ile  
           195                  200                  205  
 Ala Lys Asp Leu Leu Pro Ser Arg Asp Arg Gln His Leu Pro Leu Ile  
   210                  215                  220  
 Lys Met Lys Pro Val Pro Asp Leu Val Pro Gly Asn Phe Lys Ser Gln  
  225                  230                  235                  240  
 Leu Gln Lys Val Pro Pro Glu Trp Lys Ala Leu Thr Asp Met Pro Gln  
                   245                  250                  255  
 Met Arg Met Glu Leu Glu Arg Pro Gly Gly Asn Glu Ile Thr Arg Gly  
           260                  265                  270

Gly Ser Thr Ser Tyr Gly Thr Gly Ser Glu Thr Glu Ser Pro Arg Asn  
 275 280 285  
 Pro Ser Ser Ala Gly Ser Trp Asn Ser Gly Ser Ser Gly Pro Gly Ser  
 290 295 300  
 Thr Gly Asn Arg Asn Pro Gly Ser Ser Gly Thr Gly Gly Thr Ala Thr  
 305 310 315 320  
 Trp Lys Pro Gly Ser Ser Gly Pro Gly Ser Thr Gly Ser Trp Asn Ser  
 325 330 335  
 Gly Ser Ser Gly Thr Gly Ser Thr Gly Asn Gln Asn Pro Gly Ser Pro  
 340 345 350  
 Arg Pro Gly Ser Thr Gly Thr Trp Asn Pro Gly Ser Ser Glu Arg Gly  
 355 360 365  
 Ser Ala Gly His Trp Thr Ser Glu Ser Ser Val Ser Gly Ser Thr Gly  
 370 375 380  
 Gln Trp His Ser Glu Ser Gly Ser Phe Arg Pro Asp Ser Pro Gly Ser  
 385 390 395 400  
 Gly Asn Ala Arg Pro Asn Asn Pro Asp Trp Gly Thr Phe Glu Glu Val  
 405 410 415  
 Ser Gly Asn Val Ser Pro Gly Thr Arg Arg Glu Tyr His Thr Glu Lys  
 420 425 430  
 Leu Val Thr Ser Lys Gly Asp Lys Glu Leu Arg Thr Gly Lys Glu Lys  
 435 440 445  
 Val Thr Ser Gly Ser Thr Thr Thr Thr Arg Arg Ser Cys Ser Lys Thr  
 450 455 460  
 Val Thr Lys Thr Val Ile Gly Pro Asp Gly His Lys Glu Val Thr Lys  
 465 470 475 480  
 Glu Val Val Thr Ser Glu Asp Gly Ser Asp Cys Pro Glu Ala Met Asp  
 485 490 495  
 Leu Gly Thr Leu Ser Gly Ile Gly Thr Leu Asp Gly Phe Arg His Arg  
 500 505 510  
 His Pro Asp Glu Ala Ala Phe Phe Asp Thr Ala Ser Thr Gly Lys Thr  
 515 520 525  
 Phe Pro Gly Phe Phe Ser Pro Met Leu Gly Glu Phe Val Ser Glu Thr  
 530 535 540  
 Glu Ser Arg Gly Ser Glu Ser Gly Ile Phe Thr Asn Thr Lys Glu Ser  
 545 550 555 560  
 Ser Ser His His Pro Gly Ile Ala Glu Phe Pro Ser Arg Gly Lys Ser  
 565 570 575

Ser Ser Tyr Ser Lys Gln Phe Thr Ser Ser Thr Ser Tyr Asn Arg Gly  
 580 585 590

Asp Ser Thr Phe Glu Ser Lys Ser Tyr Lys Met Ala Asp Glu Ala Gly  
 595 600 605

Ser Glu Ala Asp His Glu Gly Thr His Ser Thr Lys Arg Gly His Ala  
 610 615 620

Lys Ser Arg Pro Val Arg Gly Ile His Thr Ser Pro Leu Gly Lys Pro  
 625 630 635 640

Ser Leu Ser Pro

<210> 6  
 <211> 491  
 <212> PRT  
 <213> Homo sapiens

<400> 6  
 Met Lys Arg Met Val Ser Trp Ser Phe His Lys Leu Lys Thr Met Lys  
 1 5 10 15

His Leu Leu Leu Leu Leu Cys Val Phe Leu Val Lys Ser Gln Gly  
 20 25 30

Val Asn Asp Asn Glu Glu Gly Phe Phe Ser Ala Arg Gly His Arg Pro  
 35 40 45

Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser Leu Arg Pro Ala Pro Pro  
 50 55 60

Pro Ile Ser Gly Gly Gly Tyr Arg Ala Arg Pro Ala Lys Ala Ala Ala  
 65 70 75 80

Thr Gln Lys Lys Val Glu Arg Lys Ala Pro Asp Ala Gly Gly Cys Leu  
 85 90 95

His Ala Asp Pro Asp Leu Gly Val Leu Cys Pro Thr Gly Cys Gln Leu  
 100 105 110

Gln Glu Ala Leu Leu Gln Gln Glu Arg Pro Ile Arg Asn Ser Val Asp  
 115 120 125

Glu Leu Asn Asn Asn Val Glu Ala Val Ser Gln Thr Ser Ser Ser Ser  
 130 135 140

Phe Gln Tyr Met Tyr Leu Leu Lys Asp Leu Trp Gln Lys Arg Gln Lys  
 145 150 155 160

Gln Val Lys Asp Asn Glu Asn Val Val Asn Glu Tyr Ser Ser Glu Leu  
 165 170 175

Glu Lys His Gln Leu Tyr Ile Asp Glu Thr Val Asn Ser Asn Ile Pro  
 180 185 190

Thr	Asn	Leu	Arg	Val	Leu	Arg	Ser	Ile	Leu	Glu	Asn	Leu	Arg	Ser	Lys	195	200	205	
Ile	Gln	Lys	Leu	Glu	Ser	Asp	Val	Ser	Ala	Gln	Met	Glu	Tyr	Cys	Arg	210	215	220	
Thr	Pro	Cys	Thr	Val	Ser	Cys	Asn	Ile	Pro	Val	Val	Ser	Gly	Lys	Glu	225	230	235	240
Cys	Glu	Glu	Ile	Ile	Arg	Lys	Gly	Gly	Glu	Thr	Ser	Glu	Met	Tyr	Leu	245	250	255	
Ile	Gln	Pro	Asp	Ser	Ser	Val	Lys	Pro	Tyr	Arg	Val	Tyr	Cys	Asp	Met	260	265	270	
Asn	Thr	Glu	Asn	Gly	Gly	Trp	Thr	Val	Ile	Gln	Asn	Arg	Gln	Asp	Gly	275	280	285	
Ser	Val	Asp	Phe	Gly	Arg	Lys	Trp	Asp	Pro	Tyr	Lys	Gln	Gly	Phe	Gly	290	295	300	
Asn	Val	Ala	Thr	Asn	Thr	Asp	Gly	Lys	Asn	Tyr	Cys	Gly	Leu	Pro	Gly	305	310	315	320
Glu	Tyr	Trp	Leu	Gly	Asn	Asp	Lys	Ile	Ser	Gln	Leu	Thr	Arg	Met	Gly	325	330	335	
Pro	Thr	Glu	Leu	Leu	Ile	Glu	Met	Glu	Asp	Trp	Lys	Gly	Asp	Lys	Val	340	345	350	
Lys	Ala	His	Tyr	Gly	Gly	Phe	Thr	Val	Gln	Asn	Glu	Ala	Asn	Lys	Tyr	355	360	365	
Gln	Ile	Ser	Val	Asn	Lys	Tyr	Arg	Gly	Thr	Ala	Gly	Asn	Ala	Leu	Met	370	375	380	
Asp	Gly	Ala	Ser	Gln	Leu	Met	Gly	Glu	Asn	Arg	Thr	Met	Thr	Ile	His	385	390	395	400
Asn	Gly	Met	Phe	Phe	Ser	Thr	Tyr	Asp	Arg	Asp	Asn	Asp	Gly	Trp	Leu	405	410	415	
Thr	Ser	Asp	Pro	Arg	Lys	Gln	Cys	Ser	Lys	Glu	Asp	Gly	Gly	Gly	Trp	420	425	430	
Trp	Tyr	Asn	Arg	Cys	His	Ala	Ala	Asn	Pro	Asn	Gly	Arg	Tyr	Tyr	Trp	435	440	445	
Gly	Gly	Gln	Tyr	Thr	Trp	Asp	Met	Ala	Lys	His	Gly	Thr	Asp	Asp	Gly	450	455	460	
Val	Val	Trp	Met	Asn	Trp	Lys	Gly	Ser	Trp	Tyr	Ser	Met	Arg	Lys	Met	465	470	475	480
Ser	Met	Lys	Ile	Arg	Pro	Phe	Phe	Pro	Gln	Gln						485	490		

<210> 7  
 <211> 453  
 <212> PRT  
 <213> Homo sapiens

<400> 7  
 Met Ser Trp Ser Leu His Pro Arg Asn Leu Ile Leu Tyr Phe Tyr Ala  
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 Asn Cys Cys Ile Leu Asp Glu Arg Phe Gly Ser Tyr Cys Pro Thr Thr  
 35 40 45  
 Cys Gly Ile Ala Asp Phe Leu Ser Thr Tyr Gln Thr Lys Val Asp Lys  
 50 55 60  
 Asp Leu Gln Ser Leu Glu Asp Ile Leu His Gln Val Glu Asn Lys Thr  
 65 70 75 80  
 Ser Glu Val Lys Gln Leu Ile Lys Ala Ile Gln Leu Thr Tyr Asn Pro  
 85 90 95  
 Asp Glu Ser Ser Lys Pro Asn Met Ile Asp Ala Ala Thr Leu Lys Ser  
 100 105 110  
 Arg Ile Met Leu Glu Glu Ile Met Lys Tyr Glu Ala Ser Ile Leu Thr  
 115 120 125  
 His Asp Ser Ser Ile Arg Tyr Leu Gln Glu Ile Tyr Asn Ser Asn Asn  
 130 135 140  
 Gln Lys Ile Val Asn Leu Lys Glu Lys Val Ala Gln Leu Glu Ala Gln  
 145 150 155 160  
 Cys Gln Glu Pro Cys Lys Asp Thr Val Gln Ile His Asp Ile Thr Gly  
 165 170 175  
 Lys Asp Cys Gln Asp Ile Ala Asn Lys Gly Ala Lys Gln Ser Gly Leu  
 180 185 190  
 Tyr Phe Ile Lys Pro Leu Lys Ala Asn Gln Gln Phe Leu Val Tyr Cys  
 195 200 205  
 Glu Ile Asp Gly Ser Gly Asn Gly Trp Thr Val Phe Gln Lys Arg Leu  
 210 215 220  
 Asp Gly Ser Val Asp Phe Lys Lys Asn Trp Ile Gln Tyr Lys Glu Gly  
 225 230 235 240  
 Phe Gly His Leu Ser Pro Thr Gly Thr Thr Glu Phe Trp Leu Gly Asn  
 245 250 255  
 Glu Lys Ile His Leu Ile Ser Thr Gln Ser Ala Ile Pro Tyr Ala Leu  
 260 265 270



Arg Val Glu Leu Glu Asp Trp Asn Gly Arg Thr Ser Thr Ala Asp Tyr  
 275 280 285  
 Ala Met Phe Lys Val Gly Pro Glu Ala Asp Lys Tyr Arg Leu Thr Tyr  
 290 295 300  
 Ala Tyr Phe Ala Gly Gly Asp Ala Gly Asp Ala Phe Asp Gly Phe Asp  
 305 310 315 320  
 Phe Gly Asp Asp Pro Ser Asp Lys Phe Phe Thr Ser His Asn Gly Met  
 325 330 335  
 Gln Phe Ser Thr Trp Asp Asn Asp Asn Asp Lys Phe Glu Gly Asn Cys  
 340 345 350  
 Ala Glu Gln Asp Gly Ser Gly Trp Trp Met Asn Lys Cys His Ala Gly  
 355 360 365  
 His Leu Asn Gly Val Tyr Tyr Gln Gly Gly Thr Tyr Ser Lys Ala Ser  
 370 375 380  
 Thr Pro Asn Gly Tyr Asp Asn Gly Ile Ile Trp Ala Thr Trp Lys Thr  
 385 390 395 400  
 Arg Trp Tyr Ser Met Lys Lys Thr Thr Met Lys Ile Ile Pro Phe Asn  
 405 410 415  
 Arg Leu Thr Ile Gly Glu Gly Gln Gln His His Leu Gly Gly Ala Lys  
 420 425 430  
 Gln Val Arg Pro Glu His Pro Ala Glu Thr Glu Tyr Asp Ser Leu Tyr  
 435 440 445  
 Pro Glu Asp Asp Leu  
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<210> 8  
 <211> 1152  
 <212> PRT  
 <213> Homo sapiens

<400> 8  
 Met Ala Leu Arg Val Leu Leu Leu Thr Ala Leu Thr Leu Cys His Gly  
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 Gly Phe Gly Gln Ser Val Val Gln Leu Gln Gly Ser Arg Val Val Val  
 35 40 45  
 Gly Ala Pro Gln Glu Ile Val Ala Ala Asn Gln Arg Gly Ser Leu Tyr  
 50 55 60  
 Gln Cys Asp Tyr Ser Thr Gly Ser Cys Glu Pro Ile Arg Leu Gln Val  
 65 70 75 80

Pro Val Glu Ala Val Asn Met Ser Leu Gly Leu Ser Leu Ala Ala Thr  
                     85                    90                    95  
 Thr Ser Pro Pro Gln Leu Leu Ala Cys Gly Pro Thr Val His Gln Thr  
                     100                    105                    110  
 Cys Ser Glu Asn Thr Tyr Val Lys Gly Leu Cys Phe Leu Phe Gly Ser  
                     115                    120                    125  
 Asn Leu Arg Gln Gln Pro Gln Lys Phe Pro Glu Ala Leu Arg Gly Cys  
                     130                    135                    140  
 Pro Gln Glu Asp Ser Asp Ile Ala Phe Leu Ile Asp Gly Ser Gly Ser  
                     145                    150                    155                    160  
 Ile Ile Pro His Asp Phe Arg Arg Met Lys Glu Phe Val Ser Thr Val  
                     165                    170                    175  
 Met Glu Gln Leu Lys Lys Ser Lys Thr Leu Phe Ser Leu Met Gln Tyr  
                     180                    185                    190  
 Ser Glu Glu Phe Arg Ile His Phe Thr Phe Lys Glu Phe Gln Asn Asn  
                     195                    200                    205  
 Pro Asn Pro Arg Ser Leu Val Lys Pro Ile Thr Gln Leu Leu Gly Arg  
                     210                    215                    220  
 Thr His Thr Ala Thr Gly Ile Arg Lys Val Val Arg Glu Leu Phe Asn  
                     225                    230                    235                    240  
 Ile Thr Asn Gly Ala Arg Lys Asn Ala Phe Lys Ile Leu Val Val Ile  
                     245                    250                    255  
 Thr Asp Gly Glu Lys Phe Gly Asp Pro Leu Gly Tyr Glu Asp Val Ile  
                     260                    265                    270  
 Pro Glu Ala Asp Arg Glu Gly Val Ile Arg Tyr Val Ile Gly Val Gly  
                     275                    280                    285  
 Asp Ala Phe Arg Ser Glu Lys Ser Arg Gln Glu Leu Asn Thr Ile Ala  
                     290                    295                    300  
 Ser Lys Pro Pro Arg Asp His Val Phe Gln Val Asn Asn Phe Glu Ala  
                     305                    310                    315                    320  
 Leu Lys Thr Ile Gln Asn Gln Leu Arg Glu Lys Ile Phe Ala Ile Glu  
                     325                    330                    335  
 Gly Thr Gln Thr Gly Ser Ser Ser Ser Phe Glu His Glu Met Ser Gln  
                     340                    345                    350  
 Glu Gly Phe Ser Ala Ala Ile Thr Ser Asn Gly Pro Leu Leu Ser Thr  
                     355                    360                    365  
 Val Gly Ser Tyr Asp Trp Ala Gly Gly Val Phe Leu Tyr Thr Ser Lys  
                     370                    375                    380

Glu Lys Ser Thr Phe Ile Asn Met Thr Arg Val Asp Ser Asp Met Asn  
 385 390 395 400  
 Asp Ala Tyr Leu Gly Tyr Ala Ala Ala Ile Ile Leu Arg Asn Arg Val  
 405 410 415  
 Gln Ser Leu Val Leu Gly Ala Pro Arg Tyr Gln His Ile Gly Leu Val  
 420 425 430  
 Ala Met Phe Arg Gln Asn Thr Gly Met Trp Glu Ser Asn Ala Asn Val  
 435 440 445  
 Lys Gly Thr Gln Ile Gly Ala Tyr Phe Gly Ala Ser Leu Cys Ser Val  
 450 455 460  
 Asp Val Asp Ser Asn Gly Ser Thr Asp Leu Val Leu Ile Gly Ala Pro  
 465 470 475 480  
 His Tyr Tyr Glu Gln Thr Arg Gly Gly Gln Val Ser Val Cys Pro Leu  
 485 490 495  
 Pro Arg Gly Arg Ala Arg Trp Gln Cys Asp Ala Val Leu Tyr Gly Glu  
 500 505 510  
 Gln Gly Gln Pro Trp Gly Arg Phe Gly Ala Ala Leu Thr Val Leu Gly  
 515 520 525  
 Asp Val Asn Gly Asp Lys Leu Thr Asp Val Ala Ile Gly Ala Pro Gly  
 530 535 540  
 Glu Glu Asp Asn Arg Gly Ala Val Tyr Leu Phe His Gly Thr Ser Gly  
 545 550 555 560  
 Ser Gly Ile Ser Pro Ser His Ser Gln Arg Ile Ala Gly Ser Lys Leu  
 565 570 575  
 Ser Pro Arg Leu Gln Tyr Phe Gly Gln Ser Leu Ser Gly Gly Gln Asp  
 580 585 590  
 Leu Thr Met Asp Gly Leu Val Asp Leu Thr Val Gly Ala Gln Gly His  
 595 600 605  
 Val Leu Leu Leu Arg Ser Gln Pro Val Leu Arg Val Lys Ala Ile Met  
 610 615 620  
 Glu Phe Asn Pro Arg Glu Val Ala Arg Asn Val Phe Glu Cys Asn Asp  
 625 630 635 640  
 Gln Val Val Lys Gly Lys Glu Ala Gly Glu Val Arg Val Cys Leu His  
 645 650 655  
 Val Gln Lys Ser Thr Arg Asp Arg Leu Arg Glu Gly Gln Ile Gln Ser  
 660 665 670  
 Val Val Thr Tyr Asp Leu Ala Leu Asp Ser Gly Arg Pro His Ser Arg  
 675 680 685

Ala Val Phe Asn Glu Thr Lys Asn Ser Thr Arg Arg Gln Thr Gln Val  
 690 695 700  
 Leu Gly Leu Thr Gln Thr Cys Glu Thr Leu Lys Leu Gln Leu Pro Asn  
 705 710 715 720  
 Cys Ile Glu Asp Pro Val Ser Pro Ile Val Leu Arg Leu Asn Phe Ser  
 725 730 735  
 Leu Val Gly Thr Pro Leu Ser Ala Phe Gly Asn Leu Arg Pro Val Leu  
 740 745 750  
 Ala Glu Asp Ala Gln Arg Leu Phe Thr Ala Leu Phe Pro Phe Glu Lys  
 755 760 765  
 Asn Cys Gly Asn Asp Asn Ile Cys Gln Asp Asp Leu Ser Ile Thr Phe  
 770 775 780  
 Ser Phe Met Ser Leu Asp Cys Leu Val Val Gly Gly Pro Arg Glu Phe  
 785 790 795 800  
 Asn Val Thr Val Thr Val Arg Asn Asp Gly Glu Asp Ser Tyr Arg Thr  
 805 810 815  
 Gln Val Thr Phe Phe Phe Pro Leu Asp Leu Ser Tyr Arg Lys Val Ser  
 820 825 830  
 Thr Leu Gln Asn Gln Arg Ser Gln Arg Ser Trp Arg Leu Ala Cys Glu  
 835 840 845  
 Ser Ala Ser Ser Thr Glu Val Ser Gly Ala Leu Lys Ser Thr Ser Cys  
 850 855 860  
 Ser Ile Asn His Pro Ile Phe Pro Glu Asn Ser Glu Val Thr Phe Asn  
 865 870 875 880  
 Ile Thr Phe Asp Val Asp Ser Lys Ala Ser Leu Gly Asn Lys Leu Leu  
 885 890 895  
 Leu Lys Ala Asn Val Thr Ser Glu Asn Asn Met Pro Arg Thr Asn Lys  
 900 905 910  
 Thr Glu Phe Gln Leu Glu Leu Pro Val Lys Tyr Ala Val Tyr Met Val  
 915 920 925  
 Val Thr Ser His Gly Val Ser Thr Lys Tyr Leu Asn Phe Thr Ala Ser  
 930 935 940  
 Glu Asn Thr Ser Arg Val Met Gln His Gln Tyr Gln Val Ser Asn Leu  
 945 950 955 960  
 Gly Gln Arg Ser Pro Pro Ile Ser Leu Val Phe Leu Val Pro Val Arg  
 965 970 975  
 Leu Asn Gln Thr Val Ile Trp Asp Arg Pro Gln Val Thr Phe Ser Glu  
 980 985 990

Asn Leu Ser Ser Thr Cys His Thr Lys Glu Arg Leu Pro Ser His Ser  
 995 1000 1005  
 Asp Phe Leu Ala Glu Leu Arg Lys Ala Pro Val Val Asn Cys Ser Ile  
 1010 1015 1020  
 Ala Val Cys Gln Arg Ile Gln Cys Asp Ile Pro Phe Phe Gly Ile Gln  
 1025 1030 1035 1040  
 Glu Glu Phe Asn Ala Thr Leu Lys Gly Asn Leu Ser Phe Asp Trp Tyr  
 1045 1050 1055  
 Ile Lys Thr Ser His Asn His Leu Leu Ile Val Ser Thr Ala Glu Ile  
 1060 1065 1070  
 Leu Phe Asn Asp Ser Val Phe Thr Leu Leu Pro Gly Gln Gly Ala Phe  
 1075 1080 1085  
 Val Arg Ser Gln Thr Glu Thr Lys Val Glu Pro Phe Glu Val Pro Asn  
 1090 1095 1100  
 Pro Leu Pro Leu Ile Val Gly Ser Ser Val Gly Gly Leu Leu Leu Leu  
 1105 1110 1115 1120  
 Ala Leu Ile Thr Ala Ala Leu Tyr Lys Leu Gly Phe Phe Lys Arg Gln  
 1125 1130 1135  
 Tyr Lys Asp Met Met Ser Glu Gly Gly Pro Pro Gly Ala Glu Pro Gln  
 1140 1145 1150

<210> 9  
 <211> 1163  
 <212> PRT  
 <213> Homo sapiens

<400> 9  
 Met Thr Arg Thr Arg Ala Ala Leu Leu Leu Phe Thr Ala Leu Ala Thr  
 1 5 10 15  
 Ser Leu Gly Phe Asn Leu Asp Thr Glu Leu Thr Ala Phe Arg Val  
 20 25 30  
 Asp Ser Ala Gly Phe Gly Asp Ser Val Val Gln Tyr Ala Asn Ser Trp  
 35 40 45  
 Val Val Val Gly Ala Pro Gln Lys Ile Thr Ala Ala Asn Gln Thr Gly  
 50 55 60  
 Gly Leu Tyr Gln Cys Gly Tyr Ser Thr Gly Ala Cys Glu Pro Ile Gly  
 65 70 75 80  
 Leu Gln Val Pro Pro Glu Ala Val Asn Met Ser Leu Gly Leu Ser Leu  
 85 90 95

Ala Ser Thr Thr Ser Pro Ser Gln Leu Leu Ala Cys Gly Pro Thr Val  
 100 105 110  
 His His Glu Cys Gly Arg Asn Met Tyr Leu Thr Gly Leu Cys Phe Leu  
 115 120 125  
 Leu Gly Pro Thr Gln Leu Thr Gln Arg Leu Pro Val Ser Arg Gln Glu  
 130 135 140  
 Cys Pro Arg Gln Glu Gln Asp Ile Val Phe Leu Ile Asp Gly Ser Gly  
 145 150 155 160  
 Ser Ile Ser Ser Arg Asn Phe Ala Thr Met Met Asn Phe Val Arg Ala  
 165 170 175  
 Val Ile Ser Gln Phe Gln Arg Pro Ser Thr Gln Phe Ser Leu Met Gln  
 180 185 190  
 Phe Ser Asn Lys Phe Gln Thr His Leu Thr Phe Glu Glu Phe Arg Arg  
 195 200 205  
 Thr Ser Asn Pro Leu Ser Leu Leu Ala Ser Val His Gln Leu Gln Gly  
 210 215 220  
 Phe Thr Tyr Thr Ala Thr Ala Ile Gln Asn Val Val His Arg Leu Phe  
 225 230 235 240  
 His Ala Ser Tyr Gly Ala Arg Arg Asp Ala Thr Lys Ile Leu Ile Val  
 245 250 255  
 Ile Thr Asp Gly Lys Lys Glu Gly Asp Thr Leu Asp Tyr Lys Asp Val  
 260 265 270  
 Ile Pro Met Ala Asp Ala Ala Gly Ile Ile Arg Tyr Ala Ile Gly Val  
 275 280 285  
 Gly Leu Ala Phe Gln Asn Arg Asn Ser Trp Lys Glu Leu Asn Asp Ile  
 290 295 300  
 Ala Ser Lys Pro Ser Gln Glu His Ile Phe Lys Val Glu Asp Phe Asp  
 305 310 315 320  
 Ala Leu Lys Asp Ile Gln Thr Gln Leu Arg Glu Lys Ile Phe Pro Ile  
 325 330 335  
 Glu Gly Thr Glu Thr Thr Ser Ser Ser Ser Phe Glu Leu Glu Met Ala  
 340 345 350  
 Gln Glu Gly Phe Ser Ala Val Phe Thr Pro Asp Gly Pro Val Leu Gly  
 355 360 365  
 Ala Val Gly Ser Phe Thr Trp Ser Gly Gly Ala Phe Leu Tyr Pro Pro  
 370 375 380  
 Asn Met Ser Pro Thr Phe Ile Asn Met Ser Gln Glu Asn Val Asp Met  
 385 390 395 400

Arg	Asp	Ser	Tyr	Leu	Gly	Tyr	Ser	Thr	Glu	Leu	Ala	Leu	Trp	Lys	Gly		405	410	415	
Val	Gln	Ser	Leu	Val	Leu	Gly	Ala	Pro	Arg	Tyr	Gln	His	Thr	Gly	Lys		420	425	430	
Ala	Val	Ile	Phe	Thr	Gln	Val	Ser	Arg	Gln	Trp	Arg	Met	Lys	Ala	Glu		435	440	445	
Val	Thr	Gly	Thr	Gln	Ile	Gly	Ser	Tyr	Phe	Gly	Pro	Ser	Leu	Cys	Ser		450	455	460	
Val	Asp	Val	Asp	Ser	Asp	Gly	Ser	Thr	Asp	Leu	Val	Leu	Ile	Gly	Pro		465	470	475	480
Pro	His	Tyr	Tyr	Glu	Gln	Thr	Arg	Gly	Ala	Gln	Val	Ser	Val	Cys	Pro		485	490	495	
Leu	Pro	Arg	Gly	Trp	Arg	Arg	Trp	Trp	Cys	Asp	Ala	Val	Leu	Tyr	Gly		500	505	510	
Glu	Gln	Gly	His	Pro	Trp	Gly	Arg	Phe	Gly	Ala	Ala	Leu	Thr	Val	Leu		515	520	525	
Gly	Asp	Val	Asn	Gly	Asp	Lys	Leu	Thr	Asp	Val	Val	Ile	Gly	Ala	Pro		530	535	540	
Gly	Glu	Glu	Glu	Asn	Arg	Gly	Ala	Val	Tyr	Leu	Phe	His	Gly	Val	Leu		545	550	555	560
Gly	Pro	Ser	Ile	Ser	Pro	Ser	His	Ser	Gln	Arg	Ile	Ala	Gly	Ser	Gln		565	570	575	
Leu	Ser	Ser	Arg	Leu	Gln	Tyr	Phe	Gly	Gln	Ala	Leu	Ser	Gly	Gly	Gln		580	585	590	
Asp	Leu	Thr	Gln	Asp	Gly	Leu	Val	Asp	Leu	Ala	Val	Gly	Ala	Arg	Gly		595	600	605	
Gln	Val	Leu	Leu	Leu	Arg	Thr	Arg	Pro	Val	Leu	Trp	Val	Gly	Val	Ser		610	615	620	
Met	Gln	Phe	Ile	Pro	Ala	Glu	Ile	Pro	Arg	Ser	Ala	Phe	Glu	Cys	Arg		625	630	635	640
Glu	Gln	Val	Val	Ser	Glu	Gln	Thr	Leu	Val	Gln	Ser	Asn	Ile	Cys	Leu		645	650	655	
Tyr	Ile	Asp	Lys	Arg	Ser	Lys	Asn	Leu	Leu	Gly	Ser	Arg	Asp	Leu	Gln		660	665	670	
Ser	Ser	Val	Thr	Leu	Asp	Leu	Ala	Leu	Asp	Pro	Gly	Arg	Leu	Ser	Pro		675	680	685	
Arg	Ala	Thr	Phe	Gln	Glu	Thr	Lys	Asn	Arg	Ser	Leu	Ser	Arg	Val	Arg		690	695	700	

Val	Leu	Gly	Leu	Lys	Ala	His	Cys	Glu	Asn	Phe	Asn	Leu	Leu	Leu	Pro	705	710	715	720
Ser	Cys	Val	Glu	Asp	Ser	Val	Thr	Pro	Ile	Thr	Leu	Arg	Leu	Asn	Phe	725	730	735	
Thr	Leu	Val	Gly	Lys	Pro	Leu	Leu	Ala	Phe	Arg	Asn	Leu	Arg	Pro	Met	740	745	750	
Leu	Ala	Ala	Asp	Ala	Gln	Arg	Tyr	Phe	Thr	Ala	Ser	Leu	Pro	Phe	Glu	755	760	765	
Lys	Asn	Cys	Gly	Ala	Asp	His	Ile	Cys	Gln	Asp	Asn	Leu	Gly	Ile	Ser	770	775	780	
Phe	Ser	Phe	Pro	Gly	Leu	Lys	Ser	Leu	Leu	Val	Gly	Ser	Asn	Leu	Glu	785	790	795	800
Leu	Asn	Ala	Glu	Val	Met	Val	Trp	Asn	Asp	Gly	Glu	Asp	Ser	Tyr	Gly	805	810	815	
Thr	Thr	Ile	Thr	Phe	Ser	His	Pro	Ala	Gly	Leu	Ser	Tyr	Arg	Tyr	Val	820	825	830	
Ala	Glu	Gly	Gln	Lys	Gln	Gly	Gln	Leu	Arg	Ser	Leu	His	Leu	Thr	Cys	835	840	845	
Asp	Ser	Ala	Pro	Val	Gly	Ser	Gln	Gly	Thr	Trp	Ser	Thr	Ser	Cys	Arg	850	855	860	
Ile	Asn	His	Leu	Ile	Phe	Arg	Gly	Gly	Ala	Gln	Ile	Thr	Phe	Leu	Ala	865	870	875	880
Thr	Phe	Asp	Val	Ser	Pro	Lys	Ala	Val	Leu	Gly	Asp	Arg	Leu	Leu	Leu	885	890	895	
Thr	Ala	Asn	Val	Ser	Ser	Glu	Asn	Asn	Thr	Pro	Arg	Thr	Ser	Lys	Thr	900	905	910	
Thr	Phe	Gln	Leu	Glu	Leu	Pro	Val	Lys	Tyr	Ala	Val	Tyr	Thr	Val	Val	915	920	925	
Ser	Ser	His	Glu	Gln	Phe	Thr	Lys	Tyr	Leu	Asn	Phe	Ser	Glu	Ser	Glu	930	935	940	
Glu	Lys	Glu	Ser	His	Val	Ala	Met	His	Arg	Tyr	Gln	Val	Asn	Asn	Leu	945	950	955	960
Gly	Gln	Arg	Asp	Leu	Pro	Val	Ser	Ile	Asn	Phe	Trp	Val	Pro	Val	Glu	965	970	975	
Leu	Asn	Gln	Glu	Ala	Val	Trp	Met	Asp	Val	Glu	Val	Ser	Leu	Pro	Gln	980	985	990	
Asn	Pro	Ser	Leu	Arg	Cys	Ser	Ser	Glu	Lys	Ile	Ala	Gly	Pro	Ala	Ser	995	1000	1005	



Asp Phe Leu Ala His Ile Gln Lys Asn Pro Val Leu Asp Cys Ser Ile  
 1010 1015 1020

Ala Gly Cys Leu Arg Phe Arg Cys Asp Val Pro Ser Phe Ser Val Gln  
 1025 1030 1035 1040

Glu Glu Leu Asp Phe Thr Leu Lys Gly Asn Leu Ser Phe Gly Trp Val  
 1045 1050 1055

Arg Gln Ile Leu Gln Lys Lys Val Ser Val Val Ser Val Ala Glu Ile  
 1060 1065 1070

Thr Phe Asp Thr Ser Val Tyr Ser Gln Leu Pro Gly Gln Glu Ala Phe  
 1075 1080 1085

Met Arg Ala Gln Thr Thr Thr Val Leu Glu Lys Tyr Lys Val His Asn  
 1090 1095 1100

Pro Thr Pro Leu Ile Val Gly Ser Ser Ile Gly Gly Leu Leu Leu Leu  
 1105 1110 1115 1120

Ala Leu Ile Thr Ala Val Leu Tyr Lys Val Gly Phe Phe Lys Arg Gln  
 1125 1130 1135

Tyr Lys Glu Met Met Glu Glu Ala Asn Gly Gln Ile Ala Pro Glu Asn  
 1140 1145 1150

Gly Thr Gln Thr Pro Ser Pro Pro Ser Glu Lys  
 1155 1160

<210> 10

<211> 769

<212> PRT

<213> Homo sapiens

<400> 10

Met Leu Gly Leu Arg Pro Pro Leu Leu Ala Leu Val Gly Leu Leu Ser  
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Leu Gly Cys Val Leu Ser Gln Glu Cys Thr Lys Phe Lys Val Ser Ser  
 20 25 30

Cys Arg Glu Cys Ile Glu Ser Gly Pro Gly Cys Thr Trp Cys Gln Lys  
 35 40 45

Leu Asn Phe Thr Gly Pro Gly Asp Pro Asp Ser Ile Arg Cys Asp Thr  
 50 55 60

Arg Pro Gln Leu Leu Met Arg Gly Cys Ala Ala Asp Asp Ile Met Asp  
 65 70 75 80

Pro Thr Ser Leu Ala Glu Thr Gln Glu Asp His Asn Gly Gly Gln Lys  
 85 90 95

Gln Leu Ser Pro Gln Lys Val Thr Leu Tyr Leu Arg Pro Gly Gln Ala  
 100 105 110

Ala Ala Phe Asn Val Thr Phe Arg Arg Ala Lys Gly Tyr Pro Ile Asp  
 115 120 125  
 Leu Tyr Tyr Leu Met Asp Leu Ser Tyr Ser Met Leu Asp Asp Leu Arg  
 130 135 140  
 Asn Val Lys Lys Leu Gly Gly Asp Leu Leu Arg Ala Leu Asn Glu Ile  
 145 150 155 160  
 Thr Glu Ser Gly Arg Ile Gly Phe Gly Ser Phe Val Asp Lys Thr Val  
 165 170 175  
 Leu Pro Phe Val Asn Thr His Pro Asp Lys Leu Arg Asn Pro Cys Pro  
 180 185 190  
 Asn Lys Glu Lys Glu Cys Gln Pro Pro Phe Ala Phe Arg His Val Leu  
 195 200 205  
 Lys Leu Thr Asn Asn Ser Asn Gln Phe Gln Thr Glu Val Gly Lys Gln  
 210 215 220  
 Leu Ile Ser Gly Asn Leu Asp Ala Pro Glu Gly Gly Leu Asp Ala Met  
 225 230 235 240  
 Met Gln Val Ala Ala Cys Pro Glu Glu Ile Gly Trp Arg Asn Val Thr  
 245 250 255  
 Arg Leu Leu Val Phe Ala Thr Asp Asp Gly Phe His Phe Ala Gly Asp  
 260 265 270  
 Gly Lys Leu Gly Ala Ile Leu Thr Pro Asn Asp Gly Arg Cys His Leu  
 275 280 285  
 Glu Asp Asn Leu Tyr Lys Arg Ser Asn Glu Phe Asp Tyr Pro Ser Val  
 290 295 300  
 Gly Gln Leu Ala His Lys Leu Ala Glu Asn Asn Ile Gln Pro Ile Phe  
 305 310 315 320  
 Ala Val Thr Ser Arg Met Val Lys Thr Tyr Glu Lys Leu Thr Glu Ile  
 325 330 335  
 Ile Pro Lys Ser Ala Val Gly Glu Leu Ser Glu Asp Ser Ser Asn Val  
 340 345 350  
 Val His Leu Ile Lys Asn Ala Tyr Asn Lys Leu Ser Ser Arg Val Phe  
 355 360 365  
 Leu Asp His Asn Ala Leu Pro Asp Thr Leu Lys Val Thr Tyr Asp Ser  
 370 375 380  
 Phe Cys Ser Asn Gly Val Thr His Arg Asn Gln Pro Arg Gly Asp Cys  
 385 390 395 400  
 Asp Gly Val Gln Ile Asn Val Pro Ile Thr Phe Gln Val Lys Val Thr  
 405 410 415

Ala Thr Glu Cys Ile Gln Glu Gln Ser Phe Val Ile Arg Ala Leu Gly  
 420 425 430  
 Phe Thr Asp Ile Val Thr Val Gln Val Leu Pro Gln Cys Glu Cys Arg  
 435 440 445  
 Cys Arg Asp Gln Ser Arg Asp Arg Ser Leu Cys His Gly Lys Gly Phe  
 450 455 460  
 Leu Glu Cys Gly Ile Cys Arg Cys Asp Thr Gly Tyr Ile Gly Lys Asn  
 465 470 475 480  
 Cys Glu Cys Gln Thr Gln Gly Arg Ser Ser Gln Glu Leu Glu Gly Ser  
 485 490 495  
 Cys Arg Lys Asp Asn Asn Ser Ile Ile Cys Ser Gly Leu Gly Asp Cys  
 500 505 510  
 Val Cys Gly Gln Cys Leu Cys His Thr Ser Asp Val Pro Gly Lys Leu  
 515 520 525  
 Ile Tyr Gly Gln Tyr Cys Glu Cys Asp Thr Ile Asn Cys Glu Arg Tyr  
 530 535 540  
 Asn Gly Gln Val Cys Gly Gly Pro Gly Arg Gly Leu Cys Phe Cys Gly  
 545 550 555 560  
 Lys Cys Arg Cys His Pro Gly Phe Glu Gly Ser Ala Cys Gln Cys Glu  
 565 570 575  
 Arg Thr Thr Glu Gly Cys Leu Asn Pro Arg Arg Val Glu Cys Ser Gly  
 580 585 590  
 Arg Gly Arg Cys Arg Cys Asn Val Cys Glu Cys His Ser Gly Tyr Gln  
 595 600 605  
 Leu Pro Leu Cys Gln Glu Cys Pro Gly Cys Pro Ser Pro Cys Gly Lys  
 610 615 620  
 Tyr Ile Ser Cys Ala Glu Cys Leu Lys Phe Glu Lys Gly Pro Phe Gly  
 625 630 635 640  
 Lys Asn Cys Ser Ala Ala Cys Pro Gly Leu Gln Leu Ser Asn Asn Pro  
 645 650 655  
 Val Lys Gly Arg Thr Cys Lys Glu Arg Asp Ser Glu Gly Cys Trp Val  
 660 665 670  
 Ala Tyr Thr Leu Glu Gln Gln Asp Gly Met Asp Arg Tyr Leu Ile Tyr  
 675 680 685  
 Val Asp Glu Ser Arg Glu Cys Val Ala Gly Pro Asn Ile Ala Ala Ile  
 690 695 700  
 Val Gly Gly Thr Val Ala Gly Ile Val Leu Ile Gly Ile Leu Leu Leu  
 705 710 715 720

Val Ile Trp Lys Ala Leu Ile His Leu Ser Asp Leu Arg Glu Tyr Arg  
 725 730 735

Arg Phe Glu Lys Glu Lys Leu Lys Ser Gln Trp Asn Asn Asp Asn Pro  
 740 745 750

Leu Phe Lys Ser Ala Thr Thr Thr Val Met Asn Pro Lys Phe Ala Glu  
 755 760 765

Ser

<210> 11

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 11

Lys Gln Ala Gly Asp Val  
 1 5

